**Lesson Plan –** **Water Quality Testing**

Students will study water quality and the effect of common pollutants while practicing their critical-thinking skills in an inquiry-based experiment.

**Main Academic Demand**

Present information appropriate to task, purpose and audience, with coherent reasoning and evidence.

**Key Idea:** The importance of fresh water, sources of water pollution and implications of pollution on the quality of water.

**Essential Questions:** How can we know the if the water we drink is safe? How can we measure the quality of water?

**Objectives:**

Students will be able to test and evaluate the quality of various water samples, collect data, and write an informative paragraph about the effects of common pollutants on the quality of water.

**New York State P-12 Science Learning Standards:**

# MS. Interdependent Relationships in Ecosystems

* **MS-LS2-5.** Evaluate competing design solutions for maintaining biodiversity and protecting ecosystem stability. [Clarification Statement: Examples of ecosystem protections could include water purification, waste management, nutrient recycling, prevention of soil erosion, and eradication of invasive species. Examples of design solution constraints could include scientific, economic, and social considerations.]

**Materials:** Dissolved oxygen meter, pH meter, thermometer, colorimeter, nitrogen, phosphorus, and silicon test kits.

**Skills to be introduced:** Water quality measurement, environmental sampling, laboratory techniques, data collection and presentation - Students will be introduced to the water quality meters. They will learn to take measurements and record them on a data sheet. Students will also take water samples and measure nutrient levels with a colorimeter.

**Vocabulary:** Water quality, pH, dissolved oxygen, turbidity temperature, colorimeter, salinity, environmental range

**Background Information:** Freshwater flowing across the earth’s surface and into streams, rivers, lakes, and wetlands is one of our most precious resources. Freshwater is continuously purified and recycled through the water cycle. The region into which surface water drains is called… (See handout)

**Lesson Overview:**

* Students will read background information.
* Students will do a pre-lab assignment to learn related vocabulary and investigate the importance of water quality testing and sources and effects of water pollutants.
* Students will conduct water quality testing on tap water and various water samples: (collected by teacher and brought to school), also samples to which pollutants have been added (fertilizers, household detergents, organic matter), as well as an “unknown” contaminated water sample.
* Students will answer lab questions and utilize charts and tables to evaluate test data.
* Students will draw conclusions and produce informative writing.

**Tasks and Activities:** (See handouts)

**Assessments:**

* Students will engage in tasks where they are performing various tests on water quality, generating data using tables, and discussing their findings with classmates.
* Students are using data to compare and contrast the differences between various water samples.
* Students will write an informative paragraph about the effects of common pollutants on the quality of water.

## Grading Evaluation Rubric

Student Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Lesson:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| **Item:** | **Points available:** | **Points earned:** |
| Vocabulary | 10 |  |
| **Background questions** | 10 |  |
| **Analysis (Data table)** | 30 |  |
| **Summary** | 20 |  |
| **Informative paragraph** | (30 total) | ------- |
| * **Problem clearly stated** | 10 |  |
| * **Supporting evidence from data** | 15 |  |
| * **Grammar, spelling, and punctuation.** | 5 |  |
| Total Points | 100 |  |
| **Comments:** | | |